

## WHAT IS CLAIMED IS:

1. A mass spectrometer comprising:

5 a clock for generating a series of clock pulses;

an ion accelerator for generating an ion pulse in response to a start signal;

10 a register for storing a register value that is incremented on each of said clock pulses;

an ion detector, spatially separated from said accelerator, for generating an ion measurement indicative of the ions striking said detector during each of said clock pulses; and

15 a finite impulse response filter for filtering said ion measurements to generate filtered ion measurements, said finite impulse response filter having a filter function that depends on the impulse response of said ion detector.

20 2. The mass spectrometer of Claim 1 wherein said filtered ion measurements have a time duration that is less than the time duration of said ion measurements.

3. The mass spectrometer of Claim 1 wherein filter function depends on said register value.

25 4. The mass spectrometer of Claim 1 further comprising:

a memory having a plurality of data values at locations specified by said register value; and

30 an adder, responsive to said clock signal, for forming the sum of said data value specified by said register value and said filtered ion measurement specified by said register value and storing said sum in said memory at said location corresponding to said register value.